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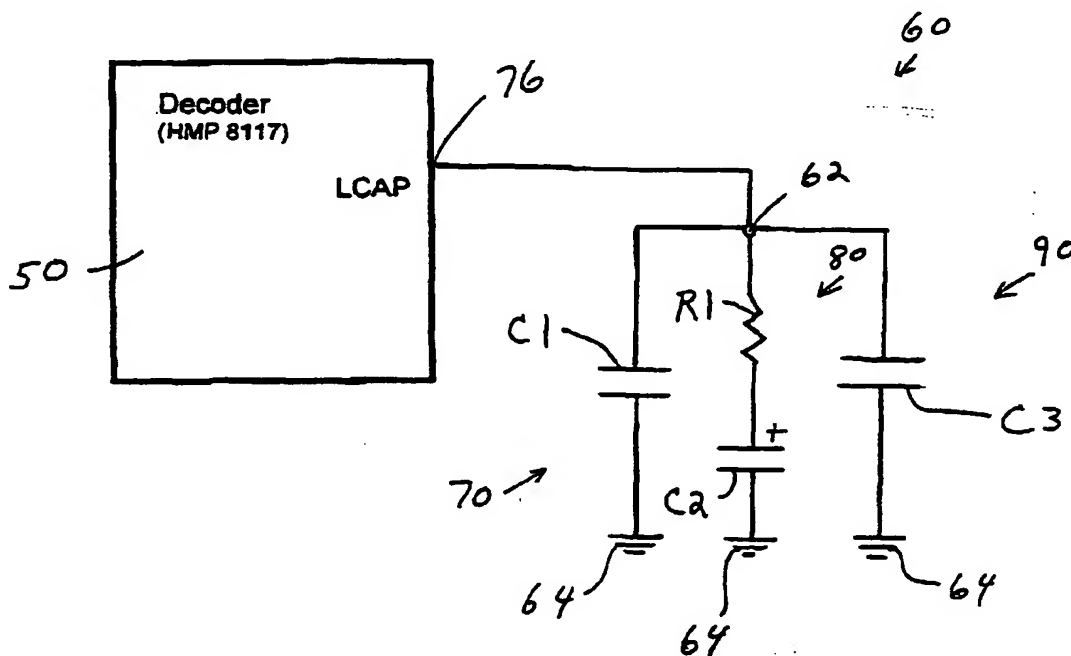
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- (72) Inventors; and
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[Continued on next page]

(54) Title: SPURIOUS FREQUENCIES ATTENUATION FOR A DC REFERENCE VOLTAGE



(57) Abstract: In a television apparatus that includes a television signal decoding integrated circuit (IC) that performs combing, PIP, OSD, chroma and luminance decoding, digitizing, and other functions, particularly on analog signals, an automatic gain control (AGC) circuit is coupled to the television signal decoding IC at its luminance DC restoration pinout. The AGC circuit provides an improved NTSC signal picture by filtering out unwanted noise and oscillations.

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— Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CLAIMS

WHAT IS CLAIMED IS:

1. A television apparatus comprising:

processing circuitry adapted to receive an analog television signal;
 5 a video decoder coupled to the processing circuitry and adapted to process the analog television signal, the video decoder adapted to provide luminance signal restoration and configured with a luminance voltage offset reference terminal adapted to aid in the luminance signal restoration; and
 an automatic gain control network coupled to the luminance voltage
 10 offset terminal.

2. The television apparatus of claim 1, wherein the automatic gain control network comprises a first, second, and third branch, parallel circuit.

15 3. The television apparatus of claim 2, wherein the first branch includes a first capacitor coupled between an analog ground and the luminance voltage offset terminal, the second branch includes a first resistor coupled in series in with a second capacitor, the first resistor and second capacitor coupled between the analog ground and the luminance voltage offset terminal, and the third
 20 branch includes a third capacitor coupled between the analog ground and the luminance voltage offset terminal.

4. The television apparatus of claim 3, wherein the first capacitor has a value of approximately 820 pF, the second capacitor has a value of
 25 approximately 6.8 μ F, the third capacitor has a value of approximately 0.27 μ F, and the first resistor has a value of approximately 720 Ω .

5. The television apparatus of claim 3, wherein the first resistor of the second branch is coupled to the luminance voltage offset terminal, and the
 30 second capacitor is coupled to the analog ground.

6. The television apparatus of claim 3, wherein values for each component of the first, second, and third branches are selected to filter a particular frequency.

5 7. In a television apparatus adapted to receive analog television signals, and having processing circuitry and a video decoder for the analog television signals, the video decoder having a luminance restoration terminal in communication with luminance restoration circuitry, an automatic gain control network for the luminance restoration circuitry comprising:

10 a first circuit branch;
 a second circuit branch;
 a third circuit branch; and

 wherein said first, second, and third branches are in parallel.

15 8. The automatic gain control network of claim 7, wherein said first circuit branch includes a first capacitor, said second circuit branch includes a first resistor in series with a second capacitor, and said third circuit branch includes a third capacitor.

20 9. The automatic gain control network of claim 8, wherein said first capacitor is coupled between the luminance restoration terminal and an analog ground, said first resistor is coupled between the luminance restoration terminal and said second capacitor which is coupled between said first resistor and the analog ground, and said third capacitor is coupled between the luminance restoration terminal and the analog ground.

25 10. The automatic gain control network of claim 9, wherein said first capacitor has a value of approximately 820 pF, said second capacitor has a value of approximately 6.8 μ F, said third capacitor has a value of approximately 0.27 μ F, and said first resistor has a value of approximately 720 Ω .

11. The automatic gain control network of claim 9, wherein values for each component of said first, second, and third branches are selected to filter a particular frequency.

5 12. In a television apparatus adapted to receive analog television signals, the television apparatus having a signal decoding integrated circuit, the signal decoding integrated circuit having luminance signal restoration capabilities and a luminance voltage offset terminal, an automatic gain control network comprising:
a first circuit branch configured to attenuate a first frequency;
10 a second circuit branch configured to attenuate a second frequency; and
a third circuit branch configured to attenuate a third frequency.

13. The automatic gain control network of claim 12, wherein said first, second, and third circuit branches are in parallel.

15 14. The automatic gain control network of claim 13, wherein said first circuit branch includes a first capacitor, said second circuit branch includes a first resistor in series with a second capacitor, and said third circuit branch includes a third capacitor.

20 15. The automatic gain control network of claim 14, wherein said first capacitor is coupled between the luminance voltage offset terminal and an analog ground, said first resistor is coupled between the luminance voltage offset terminal and said second capacitor which is coupled between said first resistor
25 and the analog ground, and said third capacitor is coupled between the luminance voltage offset terminal and the analog ground.

30 16. The automatic gain control network of claim 15, wherein said first capacitor has a value of approximately 820 pF, said second capacitor has a value of approximately 6.8 μ F, said third capacitor has a value of approximately 0.27 μ F, and said first resistor has a value of approximately 720 Ω .

CORRECTED VERSION

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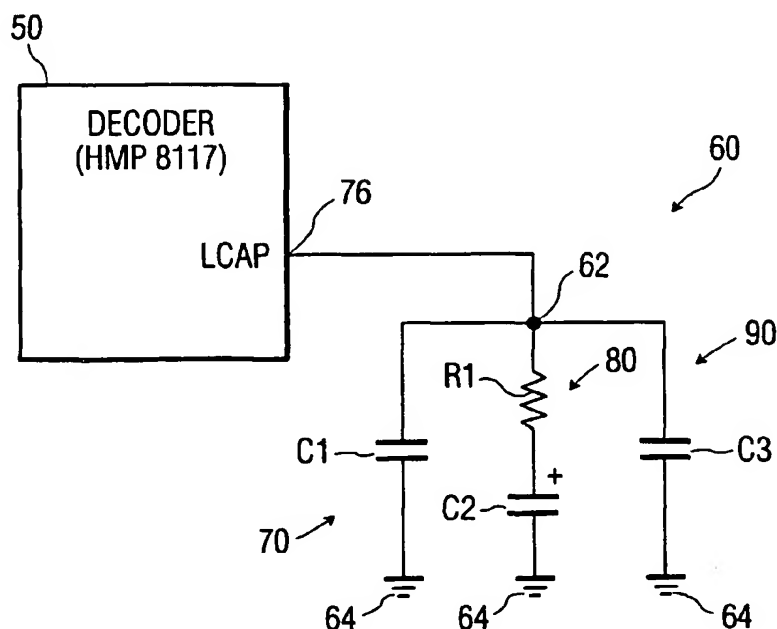
(72) Inventors; and

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(75) Inventors/Applicants (for US only): COLMAN, Gerald,

[Continued on next page]

(54) Title: SPURIOUS FREQUENCIES ATTENUATION FOR A DC REFERENCE VOLTAGE



(57) Abstract: In a television apparatus that includes a television signal decoding integrated circuit (IC) that performs combing, PIP, OSD, chroma and luminance decoding, digitizing, and other functions, particularly on analog signals, an automatic gain control (AGC) circuit is coupled to the television signal decoding IC at its luminance DC restoration pinout. The AGC circuit provides an improved NTSC signal picture by filtering out unwanted noise and oscillations.

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6 September 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

AUTOMATIC GAIN CONTROL NETWORK FOR A DECODER

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/144,426 filed on July 16, 1999.

5

Field of the Invention

The present invention relates to decoders in televisions for decoding received analog audio and video signals or transmissions and, more particularly, to an automatic gain control circuit for a decoder in a television for decoding
10 received analog audio and video signals or transmissions.

Background of the Invention

Televisions and other similar devices must now be able to receive, decode, and process analog and digital audio and video signals or transmissions. Because
15 of the complexity of modern televisions caused by digital television signals and related processing, and analog television signal processing, many of the capabilities and functions thereof are performed by specialized digital integrated circuits (ICs). Advantageously, it is also preferable to manipulate/process the television signal in the digital domain regardless of whether the original received
20 television signal is analog or digital.

Of the various types of ICs used in televisions, decoders and digitizers aid in the processing of the digital and analog television signals. One type of IC that is used in televisions for processing analog television signals is a video decoder. After processing of the analog television signal the video decoder IC generally
25 digitizes the component signals for further processing. However, during processing of the analog signal, it is necessary to provide luminance signal DC restoration.

As an example, the HMP8117 Video Decoder, from Intersil Corporation, is one type of video decoder that accepts incoming analog NTSC or PAL television
30 signals, processes the analog television signal, digitizes the signals, and then processes/manipulates the digital signals. The HMP 8117 is particularly designed

to decode baseband composite or S-video NTSC and PAL signals. Other functions are also supported.

In the HMP8117 video decoder, analog signal processing includes the restoration of a luminance signal (luminance signal restoration). Luminance signal restoration is a necessary step of television signal processing. In the HMP8117, a luminance control terminal or pin (LCAP) is furnished to provide a voltage to offset the sync tip of the luminance circuitry to a lower reference of an internal A/D converter. It is recommended by the manufacturer of the HMP8117 to couple a single storage capacitor of a given value to the LCAP pin. Such is typical of video decoders for analog signals.

It has been determined, however, that a single storage capacitor for the luminance circuitry does not provide a quality picture when the incoming, original television signal is analog. This is due to noise and oscillations that appear in the luminance decoding because of the analog signal.

Summary of the Invention

The present invention comprises an automatic gain control network or circuit for luminance signal restoration in an analog television signal video decoder. The video decoder is preferably an integrated circuit (IC) that receives the analog video television signal or transmission.

In one form, the present invention comprises a television apparatus that includes processing circuitry adapted to receive an analog television signal, a video decoder coupled to the processing circuitry and adapted to process the analog television signal, the video decoder adapted to provide luminance signal restoration and configured with a luminance voltage offset reference terminal adapted to aid in the luminance signal restoration, and an automatic gain control network coupled to the luminance voltage offset terminal.

In another form, the present invention comprises an automatic gain control network for luminance restoration circuitry in a television apparatus, wherein the television is adapted to receive analog television signals, and includes processing circuitry and a video decoder for the analog television signals, the video decoder having a luminance restoration terminal in communication with the luminance

restoration circuitry. The automatic gain control network for the luminance restoration circuitry includes, a first circuit branch, a second circuit branch, and a third circuit branch. The first, second, and third branches being situated in parallel.

5 In still another form, the present invention comprises an automatic gain control network for a television apparatus, wherein the television apparatus is adapted to receive analog television signals, has a signal decoding integrated circuit, with the signal decoding integrated circuit having luminance signal restoration capabilities and a luminance voltage offset terminal. The automatic
10 gain control network includes a first circuit branch configured to attenuate a first frequency, a second circuit branch configured to attenuate a second frequency, and a third circuit branch configured to attenuate a third frequency.

Brief Description of the Drawings

15 Reference to the following description of the present invention should be taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a block diagram of an exemplary system in which the present invention is utilized;

20 Fig. 2 is a diagram of an exemplary television apparatus circuit as used in the system of Fig. 1 incorporating the principles of the present invention; and

Fig. 3 is a diagram of an exemplary automatic gain control circuit as used in the television apparatus circuit of Fig. 2.

Corresponding reference characters indicate corresponding parts throughout the several views.

Detailed Description of the Invention

25 With reference to Fig. 1, there is shown a block diagram of a system, generally designated 10, which may utilize the present invention. It should be initially appreciated that the system 10 depicted in Fig. 1 is only exemplary
30 and/or representational of the many systems that may utilize the principles of the present invention.

The system 10 includes a television apparatus that may or may not include a monitor or other similar display device (collectively "television apparatus") generally designated 12. The television apparatus 12 is adapted through appropriate circuitry, software, and/or other components to decode and process digitally modulated analog audio and video television signals or transmissions ("digital television signals") from a Direct Broadcast Satellite (DBS) system 18 as received via a link or line 20. Such signals may be digitally modulated using the QPSK (Quadrature Phase Shift Keying) format. The television apparatus 12 is also adapted through appropriate circuitry, software, and/or other components to decode and process digital television signals from terrestrial Digital Television (DTV) antenna 14 as received via a link or line 16, such as ATSC DTV. Such signals may be digitally modulated using VSB (Vestigial SideBand).

The television apparatus 12 is also adapted through appropriate circuitry, software, and/or other components, to process analog audio and video television signals ("analog television signals") from a terrestrial analog antenna 22 as received via a link or line 24, as well as analog television signals from a CATV system 26 via a link or line 28. Such processing typically includes digitizing the video and/or audio signals through appropriate circuitry, software, and/or other components. Digital television signals from the CATV system 26 are also decoded and processed as indicated above. It should be appreciated that the television apparatus 12 is adapted to receive and process analog and/or digital television signals from sources other than that shown.

As an example of the above, the television apparatus 12 may be a model DTC 100, from Thomson Consumer Electronics, Inc. of Indianapolis, Indiana. In any form, the television apparatus 12 typically includes appropriate circuitry, software, and other components to support/provide a display, an integral control system, a user-interface and on-screen display (OSD) functionality. It should be appreciated that the television apparatus 12 may take other forms and have additional capabilities and/or functionality other than those shown and/or discussed through appropriate circuitry, software, and/or other components.

Referring to Fig. 2, there is shown a block diagram of at least some of the various components of the DTC 100 television apparatus 12. The DTC 100 television apparatus 12 is adapted through appropriate circuitry, software, and/or other components, to receive and process digital television signals and analog television signals. The various blocks and interconnections depicted in Fig. 2 are exemplary of a television capable utilizing analog and digital television signals. Thus, variations in the interconnections and components may vary.

The television apparatus 12 includes a DSS tuner/IF converter 30 that is adapted to receive a digital television signal (audio, video, and VBI/other) via line 20, allows tuning to the various channels of the digital television signal, converts the digital television signal into an Intermediate Frequency (IF), and sends the IF digital television signal (here shown as QPSK modulated) to a DSS link 32. The DSS link 32 demodulates the IF digital television signal and forwards the resulting digital television signal to a link multiplexer (MUX) 34. The link MUX 34 selectively sends the digital television signal to an ARM transport 36. The ARM transport 36 extracts a digital audio signal that is sent to an MPEG/AC-3 audio decoder 38. The audio decoder 38 decodes the digital audio signal, and sends the decoded digital audio signal to a digital to analog (D/A) converter 44. The D/A converter 44 sends the resulting analog audio signal to an audio processor 46 which send the process analog audio signal to audio amps 48 that are connected to audio speakers.

The ARM transport 36 also extracts a digital video signal that is sent to the decoder 50. The decoder 50 provides necessary MPEG circuitry and/or software to decode the digital video signal. The decoded digital video signal is sent to a digital to analog (D/A) converter and filter 52 to provide an analog television signal for further processing before being forwarded to the display.

The television apparatus 12 also includes a High Definition (HD)/NTSC tuner/IF converter and splitter 40 that receives an HD digital television signal (audio, video, and VBI/other) from the terrestrial digital antenna 14 via line 16, allows tuning to the various channels of the HD digital television signal, converts the HD digital television signal into an Intermediate Frequency (IF), and sends the HD IF digital television signal (here shown as VSB modulated) to an HDTV link

42. The HDTV link 42 demodulates the HD IF digital television signal and forwards the resulting digital signal to a link multiplexer (MUX) 34. The link MUX 34 selectively sends the digital signal to an ARM transport 36. The ARM transport 36 extracts a digital audio signal that is sent to an MPEG/AC-3 audio decoder 38. The audio decoder 38 decodes the digital audio signal, and sends the decoded digital audio signal to a digital to analog (D/A) converter 44. The D/A converter 44 sends the resulting analog audio signal to an audio processor 46 which send the process analog audio signal to audio amps 48 that are connected to audio speakers.

The ARM transport 36 also extracts a digital video signal that is sent to the decoder 50. The decoder 50 provides necessary MPEG circuitry and/or software to decode the digital video signal. The decoded digital video signal is sent to a digital to analog (D/A) converter and filter 52 to provide an analog television signal for further processing before being forwarded to the display.

The High Definition (HD)/NTSC tuner/IF converter and splitter 40 also receives digital television signals from the digital cable source 26 via line 28 and processes them in the same manner as for the terrestrial digital television signals. Additionally, the High Definition (HD)/NTSC tuner/IF converter and splitter 40 provides PIP (Picture-In-Picture) capabilities.

The High Definition (HD)/NTSC tuner/IF converter and splitter 40 also receives analog (NTSC) television signals from the terrestrial analog antenna 22 via line 24 and from the analog cable source 26 via line 28. The analog television signal is tuned by the tuner to a channel of the television signal and provides an IF analog television signal to an NTSC video switcher 56. The NTSC video switcher 56 provides the analog television signal to an initial comb filter/PIP and Chroma decoder 58 after which the analog television signal is sent to an NTSC YUV A/D converter 66 before being sent to the decoder 50.

The television signal decoding integrated circuit (IC) or chip 50 performs combing, picture-in-picture (PIP), chroma decoding and digitizing, MPEG video decoding, NTSC and PAL video upconversion, OSD, and other functions. Such a decoding IC may be an HMP8117 Video Decoder from Intersil Corporation of Palm Bay, Florida (formally Harris Semiconductor of Harris Corporation of

Melbourne Florida), the Harris Semiconductor Data Sheet of January 1999, File Number 4643, of which is specifically incorporated herein by reference.

With additional reference to Fig. 3, the decoding IC 50 is shown in a simplified block form. The decoding IC 50 also performs luminance signal DC restoration for the incoming analog television signal. In particular, the data sheet for the decoding IC 50 indicates that a storage capacitor should be attached to the LCAP (Luminance CAPacitor) pin 76 for providing luminance signal DC restoration. The value of the capacitor is stated to be $0.1\mu\text{F}$, and should be connected between the LCAP pin 76 and an AGND (Analog GrouND) pin (not shown).

In accordance with the principles of the present invention, instead of the single storage capacitor being connected to the LCAP pin 76 as suggested by the manufacturer, an automatic gain control (AGC) network or circuit 60 is connected to the LCAP pin 76 and ground. The LCAP voltage offsets a sync tip to the lower reference of an A/D converter (not shown) of the decoder 50. The AGC network 60 improves the quality of the resulting picture of the television apparatus 12 over a single storage capacitor by filtering out unwanted noise and oscillations.

The AGC network 60 is a branched, parallel network having a node 62 and a common ground 64. A first leg or branch 70, situated between the node 62 and the ground 64, includes a capacitor C1 for filtering out first frequencies of noise and/or oscillations. The capacitor C1 may have a value of 820pF . A second leg or branch 80, situated between the node 62 and the ground 64 and parallel to the first leg 70, includes a resistor R1 in series with a capacitor C2. The second leg 80 filters out second frequencies of noise and/or oscillations. The resistor R1 may have a value of 750Ω , while the capacitor C2 may have a value of $6.8\mu\text{F}$. The AGC 60 includes a third leg or branch 90 situated between the node 62 and the ground 64 and parallel to the first and second legs 70 and 80. The third leg 90 filters out third frequencies of noise and/or oscillations, and may have a value of $0.27\mu\text{F}$.

It should be appreciated that capacitor and resistor values may deviate from those stated above, depending on the desired filtering characteristics of the

AGC network 60. As well, networks other than the branched network 60 shown in Fig. 3 may be used.

While this invention has been described as having a preferred design and/or configuration, the present invention can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and which fall within the limits of the appended claims.

CLAIMS**WHAT IS CLAIMED IS:****1. A television apparatus comprising:**

processing circuitry adapted to receive an analog television signal;

5 a video decoder coupled to the processing circuitry and adapted to process the analog television signal, the video decoder adapted to provide

luminance signal restoration and configured with a luminance voltage offset

reference terminal adapted to aid in the luminance signal restoration; and

10 an automatic gain control network coupled to the luminance voltage offset terminal.

2. The television apparatus of claim 1, wherein the automatic gain control network comprises a first, second, and third branch, parallel circuit.

15 3. The television apparatus of claim 2, wherein the first branch includes a first capacitor coupled between an analog ground and the luminance voltage offset terminal, the second branch includes a first resistor coupled in series in with a second capacitor, the first resistor and second capacitor coupled between the analog ground and the luminance voltage offset terminal, and the third
20 branch includes a third capacitor coupled between the analog ground and the luminance voltage offset terminal.

4. The television apparatus of claim 3, wherein the first capacitor has a value of approximately 820 pF, the second capacitor has a value of
25 approximately 6.8 μ F, the third capacitor has a value of approximately 0.27 μ F, and the first resistor has a value of approximately 720 Ω .

5. The television apparatus of claim 3, wherein the first resistor of the second branch is coupled to the luminance voltage offset terminal, and the
30 second capacitor is coupled to the analog ground.

6. The television apparatus of claim 3, wherein values for each component of the first, second, and third branches are selected to filter a particular frequency.

5 7. In a television apparatus adapted to receive analog television signals, and having processing circuitry and a video decoder for the analog television signals, the video decoder having a luminance restoration terminal in communication with luminance restoration circuitry, an automatic gain control network for the luminance restoration circuitry comprising:

10 a first circuit branch;
 a second circuit branch;
 a third circuit branch; and
 wherein said first, second, and third branches are in parallel.

15 8. The automatic gain control network of claim 7, wherein said first circuit branch includes a first capacitor, said second circuit branch includes a first resistor in series with a second capacitor, and said third circuit branch includes a third capacitor.

20 9. The automatic gain control network of claim 8, wherein said first capacitor is coupled between the luminance restoration terminal and an analog ground, said first resistor is coupled between the luminance restoration terminal and said second capacitor which is coupled between said first resistor and the analog ground, and said third capacitor is coupled between the luminance restoration terminal and the analog ground.

25 10. The automatic gain control network of claim 9, wherein said first capacitor has a value of approximately 820 pF, said second capacitor has a value of approximately 6.8 μ F, said third capacitor has a value of approximately 0.27 μ F, and said first resistor has a value of approximately 720 Ω .

11. The automatic gain control network of claim 9, wherein values for each component of said first, second, and third branches are selected to filter a particular frequency.

5 12. In a television apparatus adapted to receive analog television signals, the television apparatus having a signal decoding integrated circuit, the signal decoding integrated circuit having luminance signal restoration capabilities and a luminance voltage offset terminal, an automatic gain control network comprising:
a first circuit branch configured to attenuate a first frequency;
10 a second circuit branch configured to attenuate a second frequency; and
a third circuit branch configured to attenuate a third frequency.

13. The automatic gain control network of claim 12, wherein said first, second, and third circuit branches are in parallel.

15 14. The automatic gain control network of claim 13, wherein said first circuit branch includes a first capacitor, said second circuit branch includes a first resistor in series with a second capacitor, and said third circuit branch includes a third capacitor.

20 15. The automatic gain control network of claim 14, wherein said first capacitor is coupled between the luminance voltage offset terminal and an analog ground, said first resistor is coupled between the luminance voltage offset terminal and said second capacitor which is coupled between said first resistor
25 and the analog ground, and said third capacitor is coupled between the luminance voltage offset terminal and the analog ground.

30 16. The automatic gain control network of claim 15, wherein said first capacitor has a value of approximately 820 pF, said second capacitor has a value of approximately 6.8 μ F, said third capacitor has a value of approximately 0.27 μ F, and said first resistor has a value of approximately 720 Ω .

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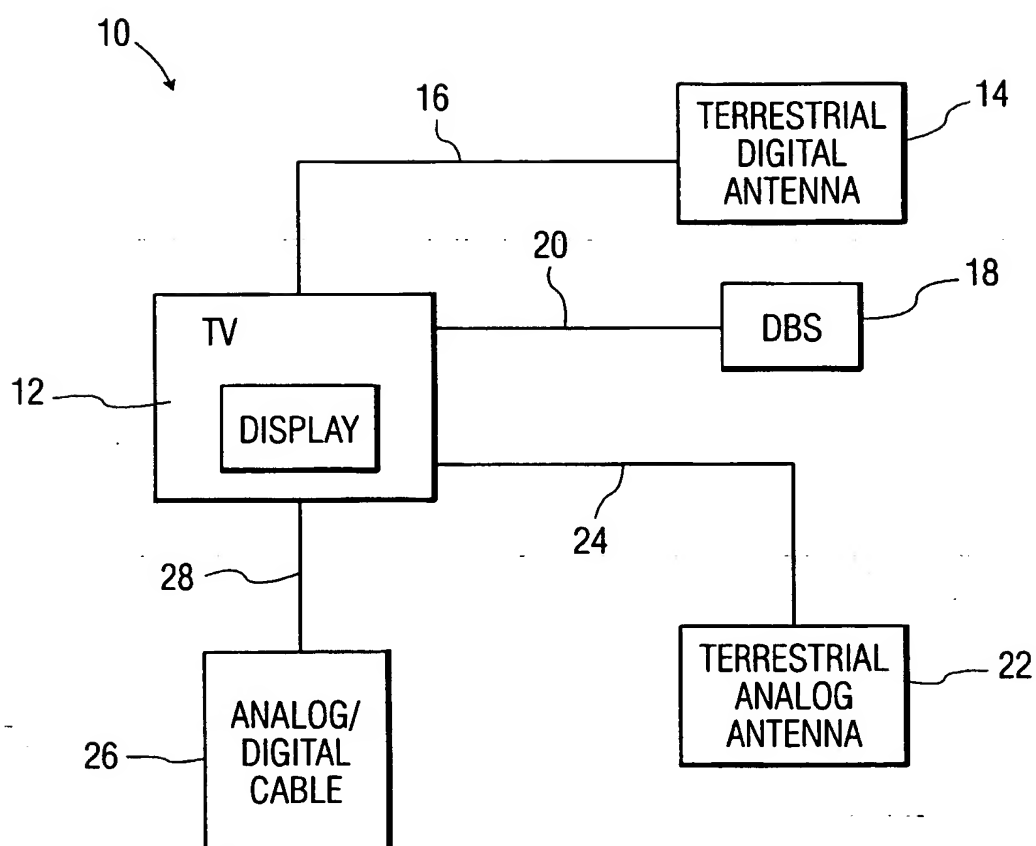


FIG. 1

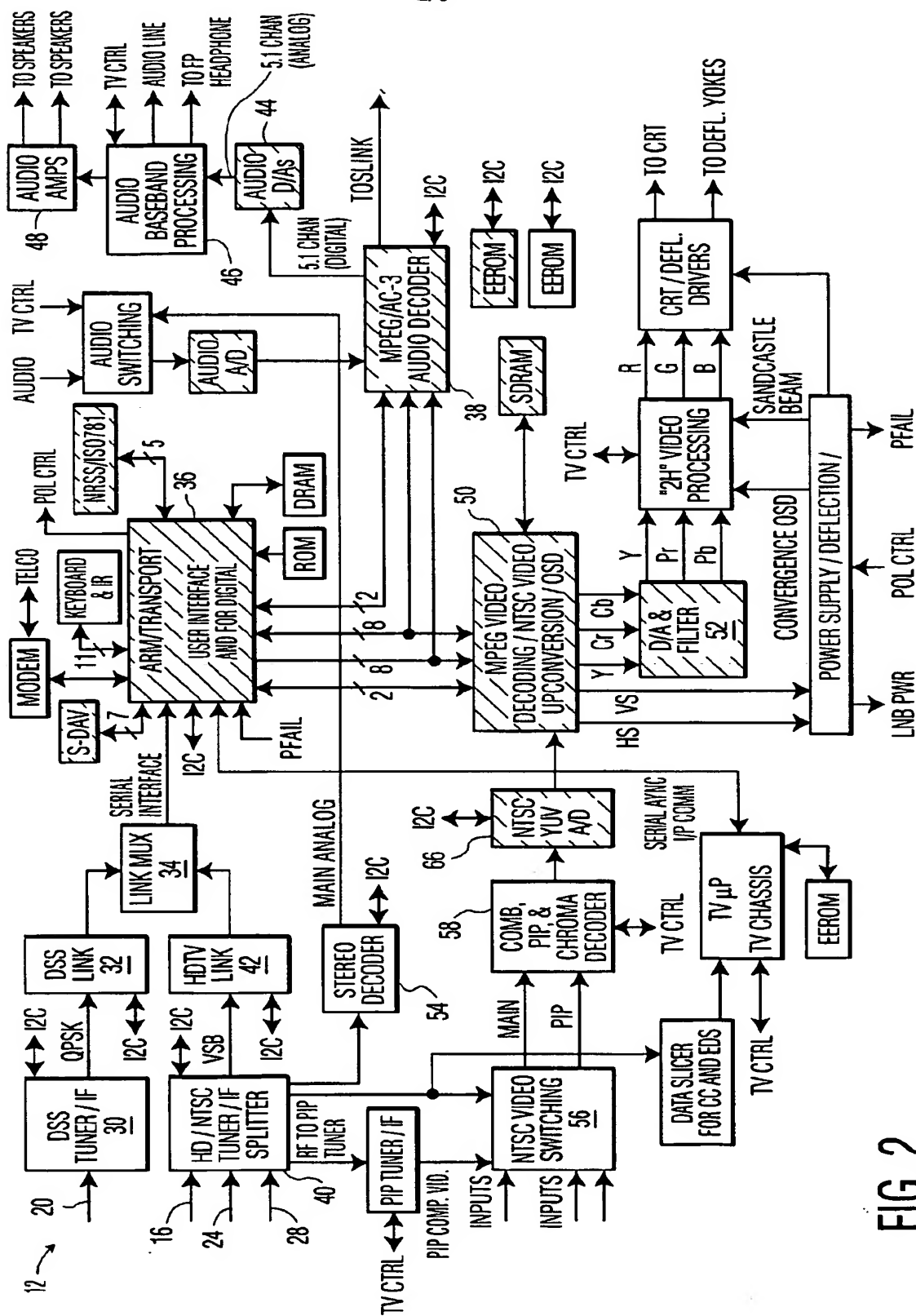


FIG. 2

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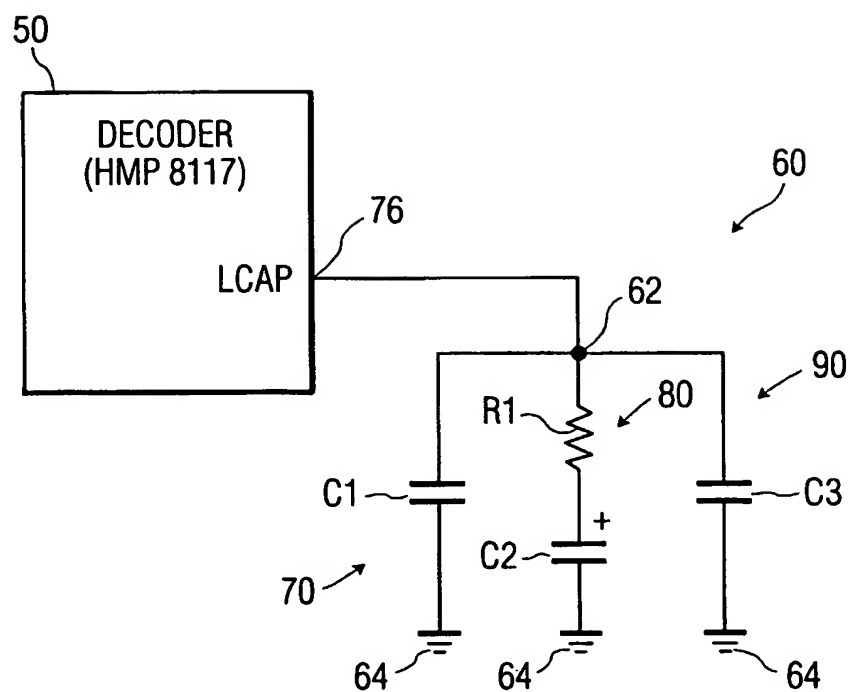


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 00/19257

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N5/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 036 292 A (HJELM ET AL.) 30 July 1991 (1991-07-30)	1,2,7
A	figure 3	3,5,6,8, 9,11-15
Y	PATENT ABSTRACTS OF JAPAN vol. 004, no. 063 (E-010), 13 May 1980 (1980-05-13) & JP 55 031348 A (TOSHIBA CORP), 5 March 1980 (1980-03-05) abstract	1-16
Y	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) -& JP 08 097641 A (FUJITSU LTD), 12 April 1996 (1996-04-12) abstract; figures 2-5	1-16

☐ Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *O* document referring to an oral disclosure, use, exhibition or other means
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T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

13 November 2000

Date of mailing of the international search report

20/11/2000

Name and mailing address of the ISA

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Authorized officer

Berwitz, P

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 00/19257

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5036292	A	30-07-1991	NONE	
JP 55031348	A	05-03-1980	NONE	
JP 08097641	A	12-04-1996	NONE	

REC'D 18 SEP 2001

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RCA89413	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US00/19257	International filing date (day/month/year) 14/07/2000	Priority date (day/month/year) 16/07/1999
International Patent Classification (IPC) or national classification and IPC H04N5/44		
Applicant THOMSON LICENSING S.A. ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 14/02/2001	Date of completion of this report 14.09.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Moorhouse, D Telephone No. +49 89 2399 8631 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/19257

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-8 as originally filed

Claims, No.:

1-16 as received on 08/08/2001 with letter of 06/08/2001

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/19257

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet —

6. Additional observations, if necessary: —

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-16
	No: Claims

Inventive step (IS)	Yes: Claims
	No: Claims 1-16

Industrial applicability (IA)	Yes: Claims 1-16
	No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Concerning Box I

The new wording of claim 1 specifies "luminance signal restoration circuitry". This includes a multitude of possibilities other than the disclosed RC networks, for none of which an enabling disclosure has been provided in the original application documents.

Whilst the paragraph bridging pages 7 and 8 mentions that the component values may vary, and the wording "networks other than the branched network 60 shown in Figure 3 may be used" was originally present, this latter wording gives no hint at what form such other networks (not circuits, e.g. active amplifiers) might take.

Concerning Box V

The following document was cited :

D1 : US-A-5 036 292

The subject-matter of claims 1 to 16 lacks an inventive step, and thus does not meet the requirement set out in Article 33 (3) PCT.

The processing circuitry and the video decoder of claim 1 are well known, e.g. in the form of the Intersil HMP8117 Video Decoder discussed in the description of the present application.

The remaining feature of the claim, which is erroneously presented in the description as an AGC network (see comments on clarity below), relates to a **passive** filter circuit for improving the frequency characteristics at the luminance voltage offset terminal.

The IPEA notes that the subject of RC filtering belongs to first year or even first semester courses for any electronic engineer. Said engineer knows that, in the presence of noise at one or more frequencies, it may be necessary to remove such noise, e.g. by filtering. The more frequencies are involved, the more complex is the circuit.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/19257

The circuitry claimed in claim 1 (interpreted as described in the description and drawings), and clearly claimed in dependent claims 2 to 6 thus cannot be considered as being of any inventive significance whatsoever.

The IPEA has also opined that the subject-matter of claims 1 to 6 is also rendered obvious by the disclosure of document D1, Figure 3 and column 3, lines 19 to 47. Although the detailed structure and the component values claimed in claims 3 to 5, 8 to 10 and 14 to 16 differ from the said disclosure, they are either equivalent structures in terms of function, or are component values which depend on the exact apparatus in which they are used, and the problems occurring therein. The skilled person would thus arrive at the subject-matter of these claims without exercising any inventive skills. The IPEA agrees with the Applicant that this document neither discloses nor suggests luminance signal restoration. Rather, the document has been cited merely to reinforce its objection that the alleged invention in fact relates to nothing more than the application of basic electrical circuit theory, set out above.

Independent claims 7 and 12 and their dependent claims, apart from the unclear scope of the protection sought (see comments below regarding clarity), specify the same features, albeit in slightly different combinations, as claims 1 to 6. The subject-matter of these claims thus lacks an inventive step, for reasons set out above.

The remaining documents cited in the International Search Report are less relevant, for reasons set out below:

PAJ/JP-A-55 031 348 Discloses the use of a single capacitor as part of both an integrating circuit and a reference voltage supply circuit for pins of an IC.

PAJ/JP-A-8 097 641 Discloses circuitry between two transistors which is conducting at DC / If so that the biasing is common, but blocks at high frequencies, so that the high frequency operations are independent.

Concerning Box VII

The sentence on page 8, lines 3 to 5 of the description constitutes subject-matter pursuant to Rule 9.1 (iv) PCT and, moreover, casts doubt on the scope of protection sought by the claims, contrary to Article 6 PCT.

Concerning Box VIII

Claims 1 to 3, 6 to 8, 11, 12 and 14 lacks clarity and/or support in the description, and therefore does not meet the requirements of Article 6 PCT.

Claims 1, 2, 7 to 11 and 12 to 16

The description relating to all these claims specifies the presence of an "automatic gain control network". The description, however, only discloses a passive filter network. The skilled person, on reading the wording "automatic gain control", either associates this with the feedback loop of an amplifier, or the use of a controllable amplifier, the control voltage of which is set in dependence upon some variable (e.g. the level of a received carrier signal). There is no support in the description for either of these possibilities. The fact that the skilled person would regard the disclosed network as a passive filter network is illustrated by column 1, lines 23 to 25 and the "detailed description" starting at column 2, line 35 of document D1.

The amended wording of claim 1 lacks clarity, essentially for the reasons set out above with respect to Box I.

Claims 7 and 12

It is not clear from the wording "In a television apparatus ... characterized by", whether protection is sought for the video decoder alone, or for the entire television apparatus. This obscurity is exacerbated by the fact that claims 7 to 11 and 13 to 16 are directed to a "luminance signal restoration circuit" alone.

It is also not clear from claim 7, that the circuit branches are designed to attenuate particular frequencies. Thus, it is not clear how the subject-matter of this claim provides any solution to the problems associated with the prior art.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/19257

Claims 3 and 8

These claims specify that each of the braches "includes" the listed elements. The wording "includes" introduces an open definition (as opposed to, for example, "consists of" or "comprising"), and thus it is not clear, which other components are to be found in the said branches, nor where in the description such other components find support.

Claims 6 and 11

Since two of the braches have only one component therein, it would appear that these claims actually intend to express the following : "wherein values for the components are selected so that each of the first, second and third branches filters a particular frequency.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RCA89413	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 19257	International filing date (day/month/year) 14/07/2000	(Earliest) Priority Date (day/month/year) 16/07/1999
Applicant THOMSON LICENSING S.A.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

SPURIOUS FREQUENCIES ATTENUATION FOR A DC REFERENCE VOLTAGE

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

3

☐ None of the figures.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference AA464F/H2	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 06666	International filing date (day/month/year) 01/03/2000	(Earliest) Priority Date (day/month/year)
Applicant THR PROCTER AND GAMBLE COMPANY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

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☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 00/06666

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K7/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 874 604 A (SRAMEK JOHN A) 17 October 1989 (1989-10-17) column 7, line 25-60; claim 1 ---	1
X	US 6 001 379 A (GRIAT JACQUELINE) 14 December 1999 (1999-12-14) column 6, line 6-47; claim 1 ---	1
A	US 5 106 609 A (BOLICH JR RAYMOND E ET AL) 21 April 1992 (1992-04-21) claims 1,11 -----	1

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

8 November 2000

Date of mailing of the international search report

20/11/2000

Name and mailing address of the ISA

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Beyss, E

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/06666

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4874604	A	17-10-1989	AT 156996 T	15-09-1997
			AU 613213 B	25-07-1991
			AU 3773089 A	12-01-1990
			CA 1328080 A	29-03-1994
			DE 68928267 D	25-09-1997
			EP 0422067 A	17-04-1991
			ES 2016469 A	01-11-1990
			NZ 229437 A	26-10-1990
			WO 8912438 A	28-12-1989
			US RE34157 E	05-01-1993
US 6001379	A	14-12-1999	FR 2709982 A	24-03-1995
			US 5863545 A	26-01-1999
			AT 175864 T	15-02-1999
			CA 2132144 A	16-03-1995
			DE 69416060 D	04-03-1999
			DE 69416060 T	27-05-1999
			EP 0642781 A	15-03-1995
			ES 2129602 T	16-06-1999
			JP 2693116 B	24-12-1997
			JP 7163859 A	27-06-1995
US 5106609	A	21-04-1992	US 5531993 A	02-07-1996
			AT 125151 T	15-08-1995
			AU 646637 B	03-03-1994
			AU 6015990 A	07-02-1991
			BR 9003858 A	03-09-1991
			CA 2022463 A,C	08-02-1991
			CN 1056051 A,B	13-11-1991
			DE 69020978 D	24-08-1995
			DE 69020978 T	14-12-1995
			DK 412710 T	11-12-1995
			EP 0412710 A	13-02-1991
			ES 2074539 T	16-09-1995
			HK 207996 A	29-11-1996
			IE 67804 B	01-05-1996
			JP 3218306 A	25-09-1991
			MX 171876 B	22-11-1993
			NZ 234797 A	26-01-1994

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 27 March 2001 (27.03.01)	
International application No. PCT/US00/19257	Applicant's or agent's file reference RCA89413
International filing date (day/month/year) 14 July 2000 (14.07.00)	Priority date (day/month/year) 16 July 1999 (16.07.99)
Applicant COLMAN, Gerald, Adolph et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

14 February 2001 (14.02.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Juan Cruz Telephone No.: (41-22) 338.83.38
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